ICT AS INQUIRY – ORIENTED APPROACH TO ENHANCE TEACHING, LEARNING, ATTITUDE AND THINKING SKILLS TOWARDS SCIENCE AT RURAL SCHOOLS

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DECLARATION

I declare that this project entitled "ICT as Inquiry – Oriented Approach To Enhance Teaching, Learning, Attitude And Thinking Skills Towards Science At Rural Schools" is the result of my own research except as cited in the references.

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ABSTRACT

The purpose of this study was to investigate ICT as inquiry-oriented approach to enhance thinking skills, attitude towards teaching and learning science at rural schools. Level of ICT usage, level of knowledge in ICT, teachers and students attitude and impact of ICT usage in understanding the concepts in science lesson have also been investigated. The study also investigates teachers and students attitude and motivation towards the use of computer in science classroom.

The respondents in this study were thirty Science teachers and seventy pupils from year 3 to year 5. Seven rural schools of Zone 7, Semanggol were involved in this study. The schools are located in Kerian district. The data collection methods used in this study were sets of questionnaires and interviews to find the obstacles in ICT usage and observation of pupils work and presentation. The data in this study was analyzed by using SPSS 14.0 software (Statistical Packages for Social Science) and presented in the form of frequency and percentage, mean and standard deviation. The findings of this study were illustrated that most of the teachers and students have positive attitude towards the use of ICT in science classroom. Also, this study was proved that students have high motivation when computers were used in Science learning classroom. Through this study, it could be concluded that the use of ICT as inquiry-oriented approach in science classroom should be encouraged because it helps to motivate students and generate a positive attitude towards Science learning.

ABSTRAK

Kajian ini bertujuan untuk mengkaji penggunaan ICT sebagai inkuiri- penemuan dalam memantapkan kemahiran berfikir dan sikap dalam pengajaran dan pembelajaran Sains di kawasan luar bandar. Tahap penggunaan ICT, tahap pengetahuan guru dan murid, serta sikap guru dan murid terhadap penggunaan ICT dan keberkesanan serta impak penggunaan ICT dalam subjek Sains juga diberi tumpuan dalam kajian ini. Sikap dan motivasi guru serta pelajar terhadap penggunaan ICT dalam pengajaran dan pembelajaran Sains juga dikenalpasti.

Dalam kajian ini, sampel responden adalah tiga puluh orang guru sains dan tujuh puluh pelajar tahun 3,4,5 dari tujuh buah sekolah luar bandar di. Kelompok 7 , Semanggol. Tujuh buah sekolah tersebut terletak di Daerah Kerian. Metodologi yang digunakan dalam kajian ini adalah set borang soal selidik untuk guru dan murid, temuramah dan kaedah pemerhatian terhadap kerja dan persembahan "PowerPoint" murid. Data yang diperolehi telah dikaji dan dianalisis menggunakan SPSS 14.0 (Statistical Packages for Social Science) dan ianya dipersembahkan dalam bentuk kekerapan dan peratusan. Keputusan kajian ini membuktikan bahawa guru dan pelajar menunjukkan sikap yang positif terhadap penggunaan ICT sebagai inkuiri-penemuan dalam memantapkan kemahiran berfikir serta sikap di dalam proses pengajaran dan pembelajaran sains di sekolah luar bandar. Selain itu, kajian ini membuktikan bahawa pelajar menunjukkan tahap motivasi yang tinggi apabila ICT digunakan di dalam proses pengajaran dan pembelajaran Sains. Kesimpulannya, penggunaan ICT di dalam proses pengajaran dan pembelajaran perlu digalakkan kerana ia membantu menyuntik motivasi guru serta pelajar dan mewujudkan sikap yang positif terhadap pembelajaran subjek Sains.

LIST OF TABLE

LIST OF DIAGRAM

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

INTRODUCTION

The Malaysian government has introduced various initiatives to facilitate greater integration of information and communication technology (ICT) to enhance the effectiveness of education and training programmers in Science. This was outlined in the country's ICT Master Plan, finalized in 2001. The long-term vision of the plan, Vision 2020, calls for sustained, productivity-driven growth, possible only with a technologically literate, critically thinking workforce, prepared to participate fully in the global economy of the 21st century. This vision can be implemented through inquiry-oriented science by using innovative ICT.

In line with the country's information and communication technology (ICT) master plan and vision 2020, which envisages its longer-term development, Malaysia recognizes that the transformation of its education system is fundamental to achieving its objectives. The Ministry of Education, with the participation of non-governmental agencies, is

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References

Albrini, A. (2006). Teachers' attitudes toward information and communication technologies: the case of Syrian EFL teachers. *Computers & Education, 47*, 373–398.

Chiappetta, E.L., & Russell, J.M. (1982). The relationship among logical thinking, problem solving instruction, and knowledge and application of earth science subject matter. *Science Education, 66*(1), 85–93.

Cox, M., Preston, C., & Cox, K. (1999). What factors support or prevent teachers from using ICT in their classrooms? *Paper presented at the British Educational Research Association Annual Conference*, University of Sussex, Brighton.

Cuban, L. (2000). So much high-tech money invested, so little use and change in practice: How come? *Paper presented for the Council of Chief State School Officers' Annual Technology Leadership Conference*, Washington, DC.

Igelsrud, D., & Leonard, W.H. (1988), Labs: What research says about biology laboratory instruction. *American Biology Teacher, 50*(5), 303–306.

Jonassen, D. H., Peck, K. L., & Wilson, B.G. (1999). *Learning with Technology: A Constructivist Perspective.* Upper Saddler River, NJ: Prentice-Hall.

Kumar, P. & Kumar, A. (2003). Effect of a Web-base project on preservice and inservise teacher' attitude toward computers and their technology skills. *Journal of Computing in Teacher Education,* Vol. 19, No. 3, pp. 87-92.

Loveless, A. (2003). Creating spaces in the primary curriculum: ICT in creative subjects. *The Curriculum Journal, 14*, 5–21.

Ma, W. W., Andersoon, R. & Streith, K. O. (2005). Examining user acceptance of computer technology: an empirical study of student teachers. *Journal of Computer Assisted Learning,* Vol. 21, pp. 387-395.

National Research Council. (1996). National science education standards. Washington, DC: National Academy Press. Retrieved July 16, 2007, from http://www.nap.edu/readingroom/books/nses/html/l.html.

National Research Council. (1999). How people learn: Brain, mind, experience, and school. Washington, DC: National Academy Press.

Novak, J.D. & Gowin, D.R. (1984). *Learning How to Learn.* Cambridge: Cambridge University Press.

Novak, D.I. And Knowles, J.G. (1991). Beginning elementary teachers' use of computers in classroom instruction. *Action in Teacher Education, (13)* 2, 43-51.

Pelgrum, W. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers & Education, 37,* 163–178.

Rogers, E. M. (1995). *Diffusion of innovations (4th Ed.)*, New York: The Free Press.

Russell, G. & Bradley, G. (1997). Teachers' computer anxiety: Implications for professional development. *Education and Information Technologies, 2*, 17–30.

Russell, M., Bebell, D., O'Dwyer, L. & O'Connor, K. (2003). Examining teacher technology use. Implications for preservice and inservice teacher preparation, *Journal of Teacher Education*, Vol. 54, No. 4, pp. 297-310

Reynolds, D. Treharne, D., & Tripp, H. (2003). ICT—the hopes and the reality. *British Journal of Educational Technology, 34*(2), 151-167.

Ruthven, K., Hennessy, S. & Brindley, S. (2004). Teacher representations of the successful use of computer-based tools and resources in secondary-school English, mathematics and science. *Teaching and Teacher Education,* Vol. 20, pp. 259-275.

Shuldman, M. (2004). Superintendent conceptions of institutional conditions that impact teacher technology integration. *Journal of Research on Technology in Education, 36*(4), 319-343.

Tinnesand, M., & Chan, A. (1987). Step 1: Throw out the instructions. *Science Teacher, 54*(6), 43–45.

Unesco (2002). *Information and Communication Technologies in Teacher Education.*Paris: Unesco.

Vaughn, Lewis(2005). *The Power of Critical Thinking' Effective Reasoning about Ordinary and*: Teachers College Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record, 104* (3), 482-515.

Zhao, Y. & Cziko, G. A. (2001). Teacher adoption of technology: a perceptual control theory perspective. *Journal of Technology and Teacher Education, 9* (1), 5-30.